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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/581,878	09/11/2000	Tadahiro Ohmi	FUK-71	7595
22855	7590 03/11/2004		EXAMINER ALEJANDRO MULERO, LUZ L	
	J. KNUTH P.C.			
3510-A STELLHORN ROAD FORT WAYNE, IN 46815-4631			ART UNIT	PAPER NUMBER
FORT WAY	NE, IN 40013-4031		1763	

DATE MAILED: 03/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

			Q <sub>d</sub>
	Application No.	Applicant(s)	
•	09/581,878	OHMI ET AL.	
Office Action Summary	Examiner	Art Unit	-
	Luz L. Alejandro	1763	•
The MAILING DATE of this communication of	appears on the cover sheet w	vith the correspondence address	
Period for Reply		MONTH (C) FROM	
A SHORTENED STATUTORY PERIOD FOR REI THE MAILING DATE OF THIS COMMUNICATION  - Extensions of time may be available under the provisions of 37 CFR after SIX (6) MONTHS from the mailing date of this communication.  - If the period for reply specified above is less than thirty (30) days, a  - If NO period for reply is specified above, the maximum statutory per  - Failure to reply within the set or extended period for reply will, by state Any reply received by the Office later than three months after the may earned patent term adjustment. See 37 CFR 1.704(b).	N. 1.136(a). In no event, however, may a reply within the statutory minimum of th od will apply and will expire SIX (6) MG that a cause the application to become	a reply be timely filed hirty (30) days will be considered timely. DNTHS from the mailing date of this communicat ABANDONED (35 U.S.C. § 133).	tion.
Status			
1) Responsive to communication(s) filed on 10	<u>0/16/03, 12/19/03</u> .		
2a) This action is <b>FINAL</b> . 2b) ☑ T	his action is non-final.		
3) Since this application is in condition for allo			is
closed in accordance with the practice unde	er <i>Ex part</i> e Quayle, 1935 C	.D. 11, 453 O.G. 213.	
Disposition of Claims			
4)⊠ Claim(s) <u>1-11</u> is/are pending in the applicat	ion.		
4a) Of the above claim(s) is/are without	drawn from consideration.		
5) Claim(s) is/are allowed.			
6)⊠ Claim(s) <u>1-11</u> is/are rejected.			
7) Claim(s) is/are objected to.			
8) Claim(s) are subject to restriction an	d/or election requirement.		
Application Papers			
9) The specification is objected to by the Exan	niner.		
10) The drawing(s) filed on is/are: a)	accepted or b)☐ objected t	to by the Examiner.	-
Applicant may not request that any objection to	the drawing(s) be held in abey	vance. See 37 CFR 1.85(a).	
Replacement drawing sheet(s) including the col	rection is required if the drawi	ng(s) is objected to. See 37 CFR 1.12	∶1(ɑ). •
11) The oath or declaration is objected to by the	e Examiner. Note the attact	ned Office Action of form P1O-132	
Priority under 35 U.S.C. § 119			
12) Acknowledgment is made of a claim for fore	eign priority under 35 U.S.C	;, § 119(a)-(d) or (f).	
a)□ All b)□ Some * c)□ None of:			
<ol> <li>Certified copies of the priority document</li> </ol>	nents have been received.		
2. Certified copies of the priority docum	nents have been received in	Application No	
3. Copies of the certified copies of the		en received in this mational stage	
application from the International Bu		not received	
* See the attached detailed Office action for a	ilist of the certified copies (	iot received.	
Attachment(s)	4) 🗍 Intervie	w Summary (PTO-413)	
<ol> <li>Notice of References Cited (PTO-892)</li> <li>Notice of Draftsperson's Patent Drawing Review (PTO-948)</li> </ol>	Paper I	No(s)/Mail Date	
Information Disclosure Statement(s) (PTO-1449 or PTO/SI Paper No(s)/Mail Date	3/08) 5) ☐ Notice 6) ☐ Other:	of Informal Patent Application (PTO-152)	

U.S. Patent and Trademark Office PTOL-326 (Rev. 1-04)

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#### **DETAILED ACTION**

## Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/19/03 has been entered.

### Claim Objections

Claim 3 and 8 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim.

Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Both claims 3 and 8 contain the limitation "wherein said vacuum vessel can be divided into a part including said processing chamber and a part having said substrate transport mechanism". Both of these limitations are in independent claims 1 and 2 (see claim 1, lines 7-20 and claim 2, lines 7-22).

Claim 10 is objected to because of the following informalities: it appears that a duplicate of claim 11 was mistakenly added to the end of claim 10. Appropriate correction is required.

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## Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4, 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al., U.S. Patent 5,580,420 in view of Takahashi, U.S.Patent 5,314,574.

Watanabe et al. shows the invention substantially as claimed including a semiconductor manufacturing apparatus for processing a substrate surface (see col. 1, lines 6-14), the apparatus comprising: a vacuum vessel 6 having a top plate 3, 66; a bottom plate 31 in which a substrate stage is provided (see figs. 1 and 4); two cylinders 15 installed surrounding the substrate stage (see col. 10, lines 28-35, and figs. 1 and 4); a gap between the cylinders and the top vacuum vessel plate is made variable by

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lifting/lowering the cylinder (see col. 7, lines 20-22); the cylinders having a lifting/lowering mechanism 36 (see col. 10, lines 28-35, and figs. 1 and 4) in order to separate a space which the cylinder surrounds comprising a processing chamber 6 from the space outside the cylinder including a transport chamber 32 for transferring the substrate and provided with a substrate conveyer mechanism 10, 101 for transferring the substrate between the processing chamber and the transport chamber through the gap (see col. 6-line 63 to col. 7-line 25); the processing chamber is provided with a processing chamber gas inlet and a gas outlet (see col. 9, lines 55-62).

Watanabe et al. does not expressly disclose that the transport chamber is provided with a gas inlet and a gas outlet, that the cylinders are provided with an O-ring, and that the cylinders are connected to the bottom plate through bellows. Takahashi discloses an apparatus in which the transfer chamber comprises a gas inlet for supplying nitrogen gas and a gas outlet connected to an exhaust system in order to set a vacuum atmosphere (see col. 5, lines 24-36 and fig. 8). Therefore, in view of this disclosure it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Watanabe et al. as to further comprise a gas inlet and a gas outlet in the transfer chamber in order to set a vacuum atmosphere.

Furthermore, Takahashi discloses the use of O-rings 21 for tightly seal the chamber and the use of bellows 22 connected to the bottom plate 23 for freely expansion and compression of the cylinders lifting/lowering mechanism (see col. 4, lines 27-53). Therefore, in view of these disclosures it would have been obvious to one

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having ordinary skill in the art at the time the invention was made to modify the apparatus disclosed by Watanabe et al. as to further comprise the claimed O-ring and bellows in order to optimize the apparatus by tightly sealing the chamber and by freely expanding and compressing the lifting/lowering mechanism.

With respect to the substrate stage having a substantially constant vertical position, note that the lower portion of the substrate stage of the apparatus of Watanabe et al. is fixedly provided on the vacuum vessel plate (see, for example, fig. 4) and therefore, it has a substantially constant vertical position relative to the vacuum vessel plate.

With respect to claims 3 and 8, note that the apparatus of Watanabe et al. shows a vacuum vessel 1 which can be divided, by cylinders 15, into a part including a processing chamber 6 and a part having a substrate transport mechanism 32 (see figs. 1 and 4). Furthermore, with respect to claims 4, 6-7 and 9-10, the Watanabe et al. reference further discloses that the apparatus comprises a microwave plasma generation mechanism for generating plasma in the processing chamber, magnetic field generating means 651-653 disposed substantially on the circumference surrounding the chamber in the atmosphere outside of the vacuum vessel, and radio frequency power source 610 provided to the substrate stage (see the abstract, col. 1-line 65 to col. 2-line 10, col. 9, line 24-62, and figs. 1 and 4).

Watanabe et al. does not expressly disclose that the magnetic field generating means are permanent magnets but it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Watanabe et al.

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as to comprise permanent magnets as the magnetic field generation means because permanent magnets are known in the art to be suitable means for generating a magnetic field and therefore their use in the apparatus of Watanabe et al. would be prima facie obvious in absence of evidence of unexpected results.

Claims 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al., U.S. Patent 5,580,420 in view of Takahashi, U.S.Patent 5,314,574. as applied to claims 1-4 and 6-10 above, and further in view of Masahiro et al., JP 10-177994.

Watanabe et al. and Takahashi do not expressly disclose that the plasma generation mechanism radiates microwave through a slot antenna. Masahiro et al. discloses a plasma treating device utilizing a microwave plasma generating device comprising a slot antenna 202 to perform uniform plasma treatment (see abstract). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Watanabe et al. as to comprise a microwave plasma generation mechanism which comprises a slot antenna in order to optimize the apparatus by performing uniform plasma treatments with high reproducibility since the microwave can be radiated stably.

# Response to Arguments

Applicant's arguments filed 10/16/03 have been fully considered but are not deemed persuasive. Applicant argues that the newly added claim limitation "a substrate

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stage fixedly provided on said vacuum vessel plate" renders the claims of record allowable. However, note that only the upper portion of the substrate stage is movable (see col. 10, lines 3-5) while the lower portion of the substrate stage of the apparatus of Watanabe et al. is fixedly provided on the vacuum vessel plate (see, for example, fig. 4) and therefore, the substrate stage has a substantially constant vertical position relative to the vacuum vessel plate as broadly claimed. Furthermore, since the lower portion of the substrate stage of the Watanabe et al. apparatus is fixed, the argued problems associated with the maintainability of the lower face of the apparatus are not present because of the fixed configuration.

Additionally, concerning the argument that the present invention does not require lifting/lowering of the wafer, it is noted that the features upon which applicant relies (i.e., an apparatus which does not require lifting/lowering of the wafer) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

#### Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 571-272-1430. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 571-272-1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Luz L. Alejandro
Primary Examiner
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March 8, 2004